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Mark E. Revis
Radio Engineer II
County of Riverside - PSEC Project
1855 Chicago Ave.
Riverside, California 92502

March 10, 2008

Introduction

At your request, I have reviewed the technical specifications and calculated the maximum radiofrequency, (RF), power density from one of the proposed County of Riverside Public Safety Enterprise Communication (PSEC) project wireless communications sites, (referenced as El Cariso), to be located at coordinates Latitude 33° 38' 44" and Longitude 117° 26' 39.7", in the Cleveland National Forest, County of Riverside, California as depicted in attachment 1A.

All antennae for the proposed El Cariso wireless communication site, (ECWCS), will be mounted on a 100 foot lattice tower. The facility will utilize three Antel BCR-80015 transmit antennae configured in three 120 degree sectors mounted with their center at 105.6 feet above grade. These antennae are designed to transmit with an effective radiated power (ERP) of up to 2,214 watts per sector within a bandwidth between approximately 806 and 900 MHz . The facility will also utilize one Kathrein-Scala CL7-150/URM transmit antennae mounted with its center at 60 feet above grade. This antenna is designed to transmit with an effective radiated power (ERP) of up to 1,557 watts within a bandwidth between approximately 147 and 174 MHz . Technical specifications of these antennae are provided in attachment two.

There will also be one Andrew UMP series eight foot diameter microwave dish mounted at 96 feet above grade. However, the high frequency (6 GHz); low power (1 watt input power) and highly focused and directional nature of emissions from this dish, preclude any significant contribute to RF exposure in occupied locations.

Calculation Methodology, Results & Recommendations

Calculations were made in accordance with the recommendations contained in the Federal Communications Commission (FCC), Office of Engineering and Technology Bulletin 65 (edition 97-01) entitled "Evaluating Compliance with FCC-Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields." Several assumptions were made in order to provide the most conservative or "worse case" projections of power densities. Calculations were made assuming that all channels were operating simultaneously at their maximum design effective radiated power. Attenuation (weakening) of the signal that would result from surrounding foliage or buildings was ignored. Buildings can reduce the signal strength by a factor of 10 (i.e.,

10 dB) or more depending upon the construction material. The ground or other surfaces were considered to be perfect reflectors (which they are not) and the RF energy was assumed to overlap and interact constructively at all locations (which they would not) thereby resulting in the calculation of the maximum potential exposure. In fact, the accumulations of all these very conservative assumptions will significantly overestimate the actual exposures that would typically be expected from actual environmental RF measurements of such a facility. However, this method is a prudent approach that errs on the side of safety.

The maximum public RF exposure from the ECWCS was calculated to be less than 14.3 % of the FCC public safety standard. The public was taken to mean anyone (e.g., rangers and visitors) at or near the site. This total exposure is comprised of $0.7 \mu\text{W}/\text{cm}^2$ (i.e., ~ 0.13 % of the public safety standard), from the Antel BCR-80015 antennae and $28.1 \mu\text{W}/\text{cm}^2$ (i.e., ~ 14.0 % of the public safety standard), from the Kathrein-Scala CL7-150/URM antenna. Exposure details are shown in appendices A-1 and A-2.

A sign conforming to with ANSI C95.2 color, symbol and content, and other markings as appropriate, should be placed close to the transmit antennae with appropriate contact information in order to alert maintenance or other workers approaching the antenna to the presence of RF transmissions and to take precautions to avoid exposures in excess of FCC limits.

RF Safety Standards

The two most widely recognized standards for protection against RF field exposure are those published by the American National Standards Institute (ANSI) C95.1 and the National Council on Radiation Protection and measurement (NCRP) report #86.

The NCRP is a private, congressionally chartered scientific institution, charged to provide expert analysis and health and safety recommendations regarding exposure to radiations of all forms. The scientific analyses of the NCRP are held in high esteem in the scientific and regulatory community both nationally and internationally. In fact, the vast majority of the radiological health regulations currently in existence can trace their origin, in some way, to the recommendations of the NCRP.

All RF exposure standards are frequency-specific, in recognition of the differential absorption of RF energy as a function of frequency. The most restrictive exposure levels in the standards are associated with those frequencies that are most readily absorbed in humans. Maximum absorption occurs at approximately 80 MHz in adults. The NCRP maximum allowable continuous occupational exposure at this frequency is $1,000 \mu\text{W}/\text{cm}^2$. This compares to $2,933 \mu\text{W}/\text{cm}^2$ at cellular frequencies and $5,000 \mu\text{W}/\text{cm}^2$ at PCS frequencies that are widely used in wireless telecommunications and are absorbed much less efficiently than exposures in the VHF TV band.

The traditional NCRP philosophy of providing a higher standard of protection for members of the general population compared to occupationally exposed individuals, prompted a two-tiered safety standard by which levels of allowable exposure were substantially reduced for "uncontrolled " (e.g., public) and continuous exposures. This measure was taken to account for the fact that workers in an industrial environment are typically exposed no more than eight hours a day while members of the general population in proximity to a source of RF radiation may be exposed continuously. This additional protection factor also provides a greater margin of safety for children, the infirmed, aged, or others who might be more sensitive to RF

exposure. After several years of evaluating the national and international scientific and biomedical literature, the members of the NCRP scientific committee selected 931 publications in the peer-reviewed scientific literature on which to base their recommendations. The current NCRP recommendations limit continuous public exposure at the transmission frequencies utilized for the proposed ECWCS to 543 and 200 $\mu\text{W}/\text{cm}^2$ for the Antel BCR-80015 and Kathrein-Scala CL7-150/URM antennae respectively.

The 1992 ANSI standard was developed by Scientific Coordinating Committee 28 (SCC 28) under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). This standard, entitled "IEEE Standards for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz" (IEEE C95.1-1991), was issued in April 1992 and subsequently adopted by ANSI. A revision of this standard (C95.1-2005) was completed in October 2005 by SCC 39 the IEEE International Committee on Electromagnetic Safety. Their recommendations are similar to the NCRP recommendations for the maximum permissible exposure (MPE) to the public and incorporates the convention of providing for a greater margin of safety for public as compared with occupational exposure. Higher whole body exposures are allowed for brief periods, provided that no 30 minute time-weighted average exposure exceeds the MPE limits.

On August 9, 1996, the Federal Communications Commission established a RF exposure standard that is a hybrid of the ANSI and NCRP standards. The MPE values used to assess environmental exposures are those of the NCRP. The FCC issued these standards in order to address its responsibilities under the National Environmental Policy Act (NEPA) to consider whether its actions will "significantly affect the quality of the human environment." In so far as there was no other standard issued by a federal agency such as the Environmental Protection Agency (EPA), the FCC utilized their rulemaking procedure to consider which standards should be adopted. The FCC received thousands of pages of comments over a three-year review period from a variety of sources including the public, academia, federal health and safety agencies (e.g., EPA & FDA) and the telecommunications industry. The FCC gave special consideration to the recommendations by the federal health agencies because of their special responsibility for protecting the public health and safety. In fact, the maximum permissible exposure (MPE) values in the FCC standard are those recommended by EPA and FDA. The FCC standard incorporates various elements of the 1992 ANSI and NCRP standards which were chosen because they are widely accepted and technically supportable. There are a variety of other exposure guidelines and standards set by other national and international organizations and governments, the vast majority of which, are similar to the current FCC standard.

The FCC standards "Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation" (Report and Order FCC 96-326) adopted the ANSI/IEEE definitions for controlled and uncontrolled environments. In order to use the higher exposure levels associated with a controlled environment, RF exposures must be occupationally related (e.g., wireless company RF technicians) and they must be aware of and have sufficient knowledge to control their exposure. All other environmental areas are considered uncontrolled (e.g., public) for which the stricter (i.e., lower) environmental exposure limits apply.

The task for the physical, biological, and medical scientists that evaluate health implications of the RF data base has been to identify those RF field conditions that can produce harmful biological effects. No panel of experts can guarantee safe levels of exposure because safety is a null concept, and negatives are not susceptible to proof. What a dispassionate scientific assessment can offer is the presumption of safety when RF-field conditions do not give rise to a demonstrable harmful effect.

Summary & Conclusions

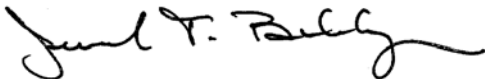
This proposed wireless communications facility, as specified above, will be in full compliance with FCC RF public safety standards for continuous exposure. These types of wireless facilities use, by design and operation, low-power transmitters. Even under maximal exposure conditions in which all the channels from all antennae are operating simultaneously at full power, the maximum cumulative exposure will not exceed 14.13% of the public safety standard at any publically accessible location. This maximum exposure is seven times lower than the FCC public exposure standards for these frequencies.

It is important to realize that the FCC maximum allowable exposures are not set at a threshold between safety and known hazard, but rather at 50 times below a level that the majority of the scientific community believes may pose a health risk to human populations. Thus, the previously mentioned maximum public exposure from the site represents a "safety margin" from this threshold of potentially adverse health effects of more than 350 times.

Given the low levels of radiofrequency fields that would be generated from this facility, and given the evidence on biological effects in a large data base, there is no scientific basis to conclude that harmful effects will attend the utilization of the proposed wireless communications facility. This conclusion is supported by a large numbers of scientists that have participated in standard-setting activities in the United States who are overwhelmingly agreed that RF radiation exposure below the FCC exposure limits has no demonstrably harmful effects on humans.

These findings are based on my professional evaluation of the scientific issues related to the health and safety of non-ionizing electromagnetic radiation and my analysis of the technical specification as provided by the County of Riverside. The opinions expressed herein are based on my professional judgment and are not intended to necessarily represent the views of any other organization or institution. Please contact me if you require any additional information.

Sincerely,



Jerrold T. Bushberg Ph.D., DABMP, DABSNM
Diplomate, American Board of Medical Physics (DABMP)
Diplomate, American Board of Science in Nuclear Medicine (DABSNM)

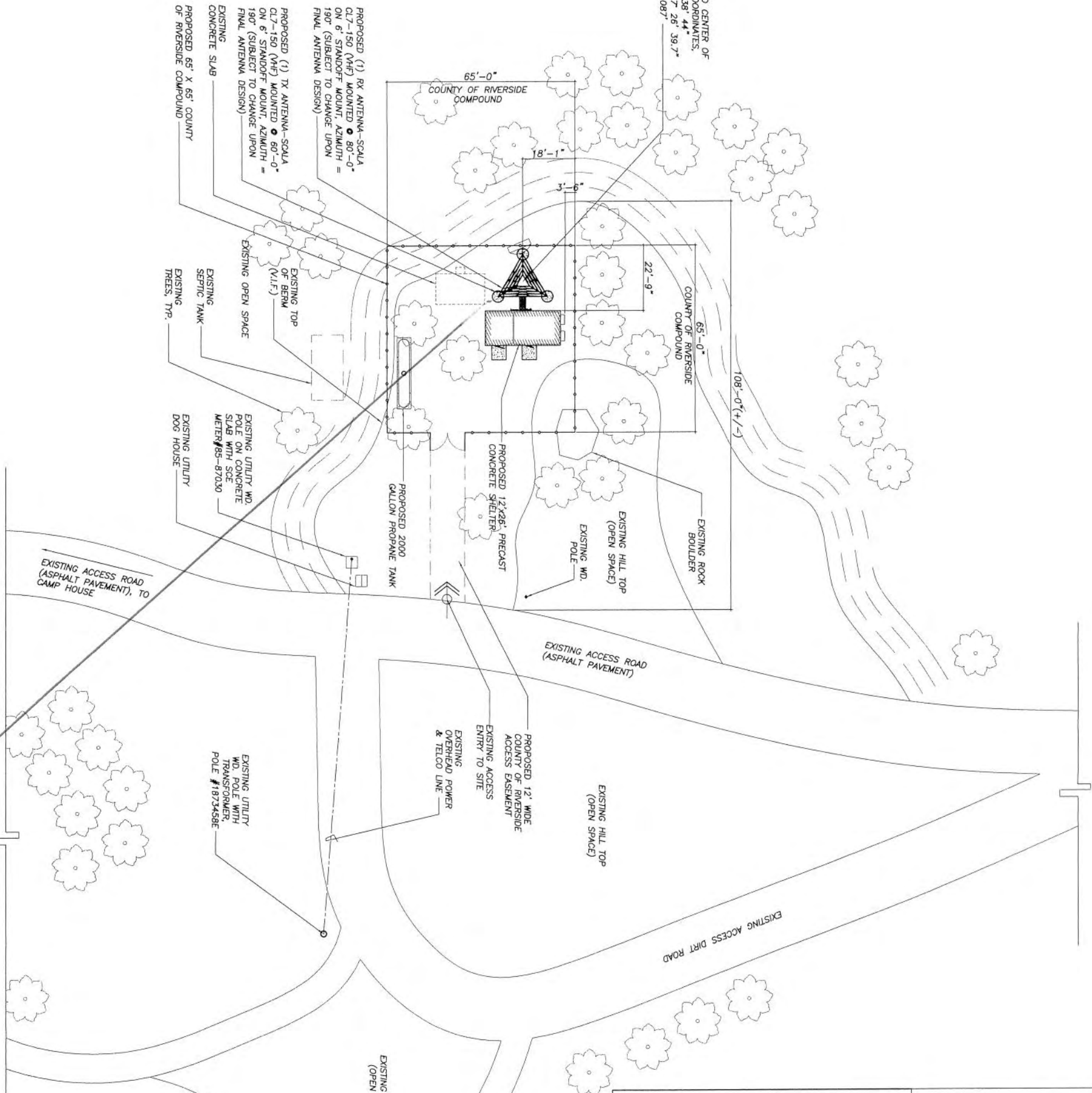
Enclosures: Attachments 1, 2; Appendices A-1&A-2, and Statement of Experience.

Attachment 1

Site Specifications

SITE PLAN/ PLOT PLAN

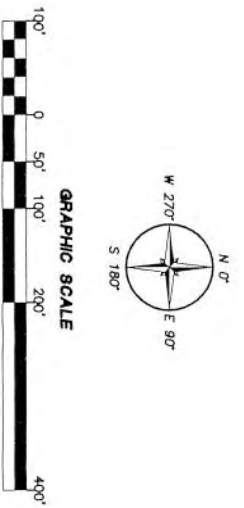
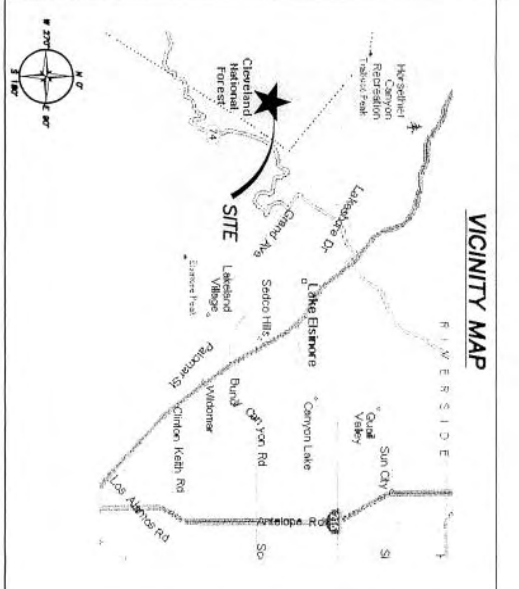
PROPOSED CENTER OF
TOWER COORDINATES:
LAT: 33° 38' 44"
LONG: 117° 26' 39.7"
ELEV: 3,087'



NEAREST STRUCTURE
175' SE

DRIVING DIRECTIONS FROM RIVERSIDE COUNTY OFFICE

SUMMIT: 42.5 MILES (1 HOUR, 1 MINUTE)
0.0 TURN LEFT (EAST) ON CHICAGO AVE. RIVERSIDE, CA 92507 ON CHICAGO AVE
0.8 TURN LEFT (EAST) ON 3RD ST 0.3 MI
1.1 TAKE RAMP (RIGHT) ONTO I-215 (SR-60)
1.4 TAKE RAMP (LEFT) ONTO SR-74 (SR-60)
1.6.6 BEAR RIGHT (SOUTH) ONTO (N) 0.57 SR 57.6 MI
17.1 TURN RIGHT (WEST) ONTO SR-74 (W 4TH ST) 57.6 MI
26.7 TURN RIGHT (NORTH-WEST) ONTO SR-74 (COLLIER AVE) 5.5 MI
27.2 TURN LEFT (SOUTH-WEST) ONTO SR-74 (RIVERSIDE DR) 3.8 MI
31.0 KEEP RIGHT ONTO LOCAL ROAD(S) 54 YDS
31.2 BEAR RIGHT (SOUTH-WEST) ONTO SR-74 (FORTEA HWY) 5.1 MI
32.4 BEAR RIGHT (SOUTH) ONTO SR-74 (SR-55) 0.6 MI
36.6 BEAR LEFT (EAST) ONTO MAIN DRIVE TRUCK TRAIL (SR-55) 1.8 MI
40.6 BEAR LEFT (EAST) ONTO MAIN DRIVE TRUCK TRAIL (SR-55) 1.8 MI
42.3 ROAD VALUE CHANGES TO LONG CANYON RD (MAIN DRIVE TRUCK TRAIL) 1 MI
42.4 TURN RIGHT (SOUTH) ONTO LOCAL ROAD(S)
42.5 ARRIVE EL CARISO A (HOT SPOT CAMP)



<p>6450 SEQUENCE DR SAN DIEGO, CA 92121</p>		<p>RIVERSIDE COUNTY COMMUNICATION</p> <p>1855 CHICAGO AVE. RIVERSIDE, CA 92507</p>		<p>PLANS PREPARED BY:</p> <p>Communication Services, Inc. 1 Corporate Dr. Suite 220 VOICE: 714.228.1440 FAX: 714.228.1445</p>	
<p>PROJECT INFORMATION</p> <p>COUNTY OF RIVERSIDE</p> <p>PSEC</p> <p>EL CARISO A</p>					
NO.	DATE	DESCRIPTION	BY		
1	01/09/08	PRELIMINARY	AU		
<p>SHEET TITLE</p> <p>SITE PLAN / PLOT PLAN</p> <p>SHEET NUMBER</p> <p>Z-1</p>					

MOTOROLA INC.
 6450 SEQUENCE DR
 SAN DIEGO, CA 92121



1855 CHICAGO AVE.
 RIVERSIDE, CA 92507

PLANS PREPARED BY



Communication Services, Inc.
 1 Coleridge Dr., Suite 120
 San Diego, CA 92108
 VOICE 714.281.1440 FAX 714.228.1445

PROJECT INFORMATION

COUNTY OF RIVERSIDE
PSEC
EL CARISO A

NO.	DATE	DESCRIPTION	BY
1	01/09/08	PRELIMINARY	AU

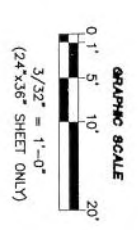
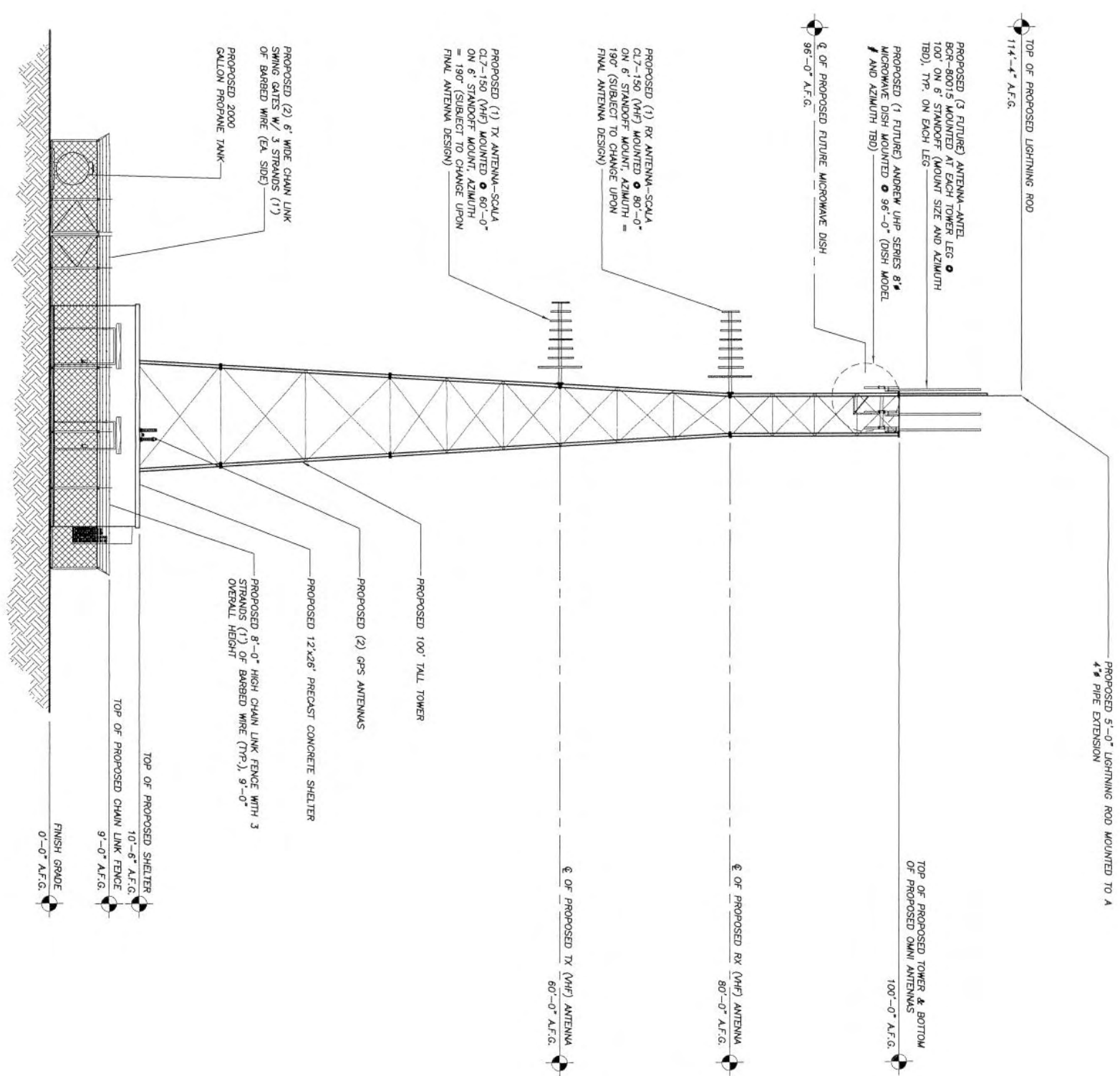
SEAL

SHEET TITLE

ELEVATION

SHEET NUMBER

Z-2



ELEVATION

Attachment 2

Antenna Specifications

BCR-80015 __

When ordering replace " __ " with connector type.

Mechanical specifications

Length	3445 mm	135.6 in
Width	360 mm	14.2 in
Depth	170 mm	6.7 in
4) Weight	19 kg	42 lbs
Wind Area	0.5 m ²	5.4 ft ²
Wind load at 50 m/s	710 N	160 lbs

Antenna and reflector consisting of aluminum alloy. Dipoles covered by a fiberglass radome. All polyurethane painted. **Inverted models available.**

Mounting and Downtilting

Support pipe: Aluminum alloy diameter Ø70 mm (2.8 in), length 500 mm (19.7 in).

Mounting brackets attach to a pipe diameter of Ø50-160 mm (2.0-6.3 in).

Mounting bracket kit #36300090
Downtilt bracket kit #36411001

The downtilt bracket kit includes the mounting bracket kit.

Electrical specifications

Frequency Range	806-900 MHz
Impedance	50Ω
3) Connector(s)	NE or E-DIN 1 port / bottom
1) VSWR	≤ 1.5:1
Polarization	Vertical
1) Gain	15 dBd
2) Power Rating	500 W
1) Half Power Angle	
H-Plane	120°
E-Plane	7°
1) Electrical Downtilt	1.25°
1) Null Fill	5%
Lightning Protection	Direct Ground

1) Typical values.

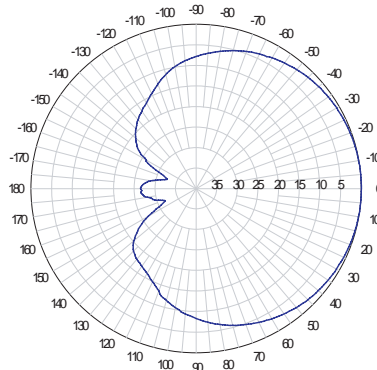
2) Power rating limited by connector only.

3) NE indicates an elongated N connector. E-DIN indicates an elongated DIN connector.

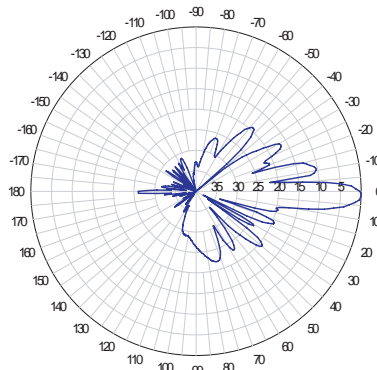
4) The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation pattern¹⁾



Horizontal



Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- A 1¼" four-channel extrusion running the entire length of the antenna for unmatched strength and rigidity.
- Durable brass feedline design that eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

This Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Inverted Models Available.

806-900 MHz



The Kathrein Scala Division CL7-150 broadband log periodic antenna is intended for use in professional fixed-station applications in the 147–174 MHz band. It features:

- Heavy-duty construction.
- Anodized, double-laminated heavy wall 6061-T6 aluminum tubing elements.
- Easy element replacement.
- Double-boom of two-inch 6061-T6 square aluminum tube.
- High front-to-back and front-to-side ratios, without minor lobes.
- Excellent performance, even in icing conditions.



(Shown vertically polarized)

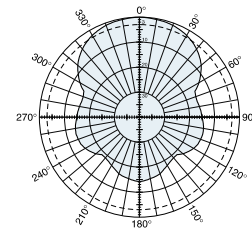
Specifications:

Frequency range	147–174 MHz (broadband)
Gain	9.3 dBi
Impedance	50 ohms
VSWR	<1.5:1
Polarization	Horizontal or vertical
Front-to-back ratio	>25 dB
Maximum input power	250 watts (at 50°C)
H-plane beamwidth	82 degrees (half-power)
E-plane beamwidth	48 degrees (half-power)
Connector	N female
Weight	25 lb (11.4 kg)
Dimensions	53.3 x 40.3 inches (maximum) (1353 x 1022 mm)
Equivalent flat plate area	2.5 ft ² (0.232 m ²) (maximum)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	59 x 9 x 8 inches (1499 x 229 x 203 mm)
Shipping weight	30 lb (13.6 kg)
Mounting	For masts of 2.375 inches (60 mm) OD.

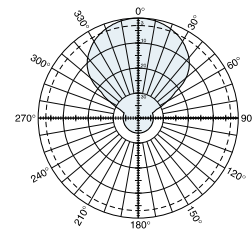
CL7-150/HCM Horizontal center-mount

CL7-150/URM Horizontal or vertical rear-mount

See reverse for order information.



H-plane
Horizontal pattern – V-polarization
Vertical pattern – H-polarization



E-plane
Horizontal pattern – H-polarization
Vertical pattern – V-polarization

* Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.

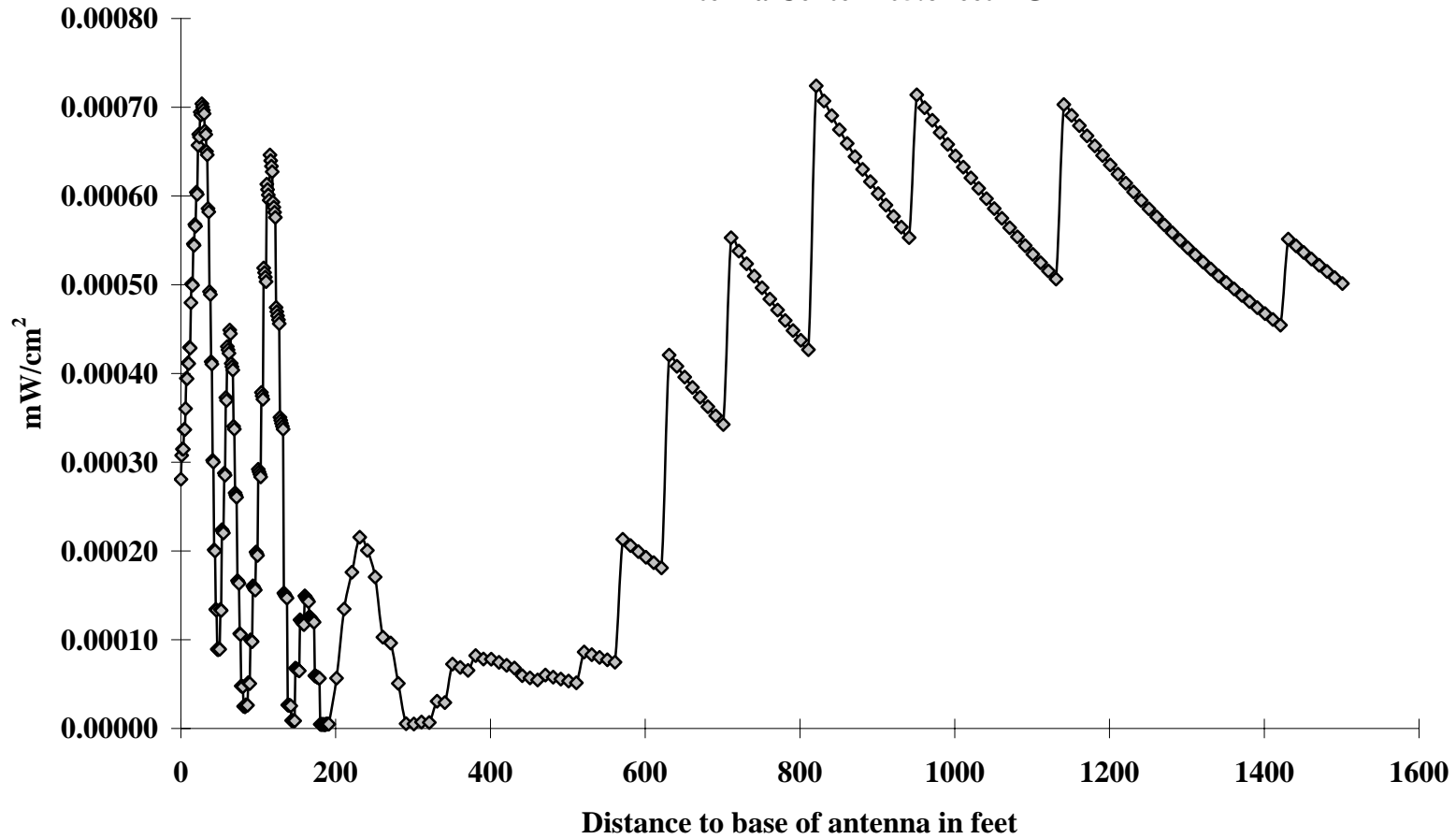


10239-B

Appendix A-1

**Antel Model BCR-80015
Exposure Calculation 6.0 ft AGL
Antenna Center 105.6 ft
ERP 2,214 Watts (806-900 MHz)**

Antel BCR80015 (806-900 MHz) RF exposure levels AGL= 6 feet
RF Antenna Center 105.6 feet AGL



ARL 99.6 **Max gain (dBd):** 15

Max exposure: 0.00072412 **mW/cm²**

Max ERP(W): 2214 **Ant type:** Antel BCR-80015

Feet from site: 821

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
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0	90.000	-11.5	-26.5	3035.81	4956.5286	0.00028	0.05170
1	89.425	-11.1	-26.1	3035.96	5434.7255	0.00031	0.05669
2	88.850	-11	-26	3036.42	5561.3166	0.00031	0.05799
3	88.275	-11	-26	3037.18	5561.3166	0.00031	0.05796
4	87.700	-10.7	-25.7	3038.26	5959.0581	0.00034	0.06206
5	87.126	-10.7	-25.7	3039.63	5959.0581	0.00034	0.06201
6	86.553	-10.4	-25.4	3041.31	6385.2457	0.00036	0.06637
7	85.980	-10	-25	3043.30	7001.2827	0.00039	0.07267
8	85.408	-10	-25	3045.59	7001.2827	0.00039	0.07257
9	84.837	-9.8	-24.8	3048.18	7331.2430	0.00041	0.07586
10	84.267	-9.8	-24.8	3051.07	7331.2430	0.00041	0.07571
11	83.698	-9.6	-24.6	3054.27	7676.7539	0.00043	0.07911
12	83.130	-9.6	-24.6	3057.76	7676.7539	0.00043	0.07893
13	82.564	-9.1	-24.1	3061.56	8613.4595	0.00048	0.08835
14	81.999	-8.9	-23.9	3065.65	9019.3994	0.00050	0.09226
15	81.435	-8.9	-23.9	3070.04	9019.3994	0.00050	0.09200
16	80.874	-8.5	-23.5	3074.73	9889.5747	0.00055	0.10057
17	80.314	-8.5	-23.5	3079.71	9889.5747	0.00054	0.10024
18	79.756	-8.3	-23.3	3084.99	10355.6560	0.00057	0.10461
19	79.200	-8.3	-23.3	3090.55	10355.6560	0.00057	0.10423
20	78.646	-8	-23	3096.41	11096.2854	0.00060	0.11126
21	78.094	-8	-23	3102.55	11096.2854	0.00060	0.11082
22	77.544	-7.6	-22.6	3108.98	12166.8349	0.00066	0.12101
23	76.997	-7.5	-22.5	3115.70	12450.2369	0.00067	0.12330
24	76.452	-7.5	-22.5	3122.70	12450.2369	0.00067	0.12275
25	75.910	-7.3	-22.3	3129.98	13036.9985	0.00069	0.12793
26	75.370	-7.3	-22.3	3137.54	13036.9985	0.00069	0.12732
27	74.833	-7.2	-22.2	3145.38	13340.6692	0.00070	0.12964
28	74.298	-7.2	-22.2	3153.49	13340.6692	0.00070	0.12897
29	73.766	-7.2	-22.2	3161.87	13340.6692	0.00070	0.12829
30	73.237	-7.2	-22.2	3170.53	13340.6692	0.00069	0.12759

ARL 99.6 **Max gain (dBd):** 15

Max exposure: 0.00072412 **mW/cm²**

Max ERP(W): 2214 **Ant type:** Antel BCR-80015

Feet from site: 821

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
31	72.712	-7.3	-22.3	3179.45	13036.9985	0.00067	0.12398
32	72.189	-7.3	-22.3	3188.65	13036.9985	0.00067	0.12327
33	71.669	-7.4	-22.4	3198.10	12740.2402	0.00065	0.11975
34	71.152	-7.4	-22.4	3207.82	12740.2402	0.00065	0.11903
35	70.638	-7.8	-22.8	3217.79	11619.2372	0.00059	0.10788
36	70.128	-7.8	-22.8	3228.03	11619.2372	0.00058	0.10720
37	69.621	-8.5	-23.5	3238.51	9889.5747	0.00049	0.09065
38	69.117	-8.5	-23.5	3249.25	9889.5747	0.00049	0.09005
39	68.616	-9.2	-24.2	3260.24	8417.3932	0.00041	0.07613
40	68.119	-9.2	-24.2	3271.48	8417.3932	0.00041	0.07561
41	67.626	-10.5	-25.5	3282.96	6239.8998	0.00030	0.05566
42	67.135	-10.5	-25.5	3294.68	6239.8998	0.00030	0.05526
43	66.649	-12.2	-27.2	3306.65	4218.6900	0.00020	0.03709
44	66.166	-12.2	-27.2	3318.85	4218.6900	0.00020	0.03682
45	65.686	-13.9	-28.9	3331.28	2852.1845	0.00013	0.02471
46	65.210	-13.9	-28.9	3343.94	2852.1845	0.00013	0.02452
47	64.738	-15.6	-30.6	3356.84	1928.3134	0.00009	0.01645
48	64.269	-15.6	-30.6	3369.96	1928.3134	0.00009	0.01632
49	63.804	-15.5	-30.5	3383.30	1973.2296	0.00009	0.01657
50	63.343	-15.5	-30.5	3396.87	1973.2296	0.00009	0.01644
51	62.885	-13.7	-28.7	3410.65	2986.6038	0.00013	0.02468
52	62.431	-13.7	-28.7	3424.65	2986.6038	0.00013	0.02448
53	61.981	-11.4	-26.4	3438.86	5071.9810	0.00022	0.04123
54	61.535	-11.4	-26.4	3453.29	5071.9810	0.00022	0.04089
55	61.092	-11.4	-26.4	3467.92	5071.9810	0.00022	0.04054
56	60.653	-10.2	-25.2	3482.75	6686.1731	0.00029	0.05299
57	60.218	-10.2	-25.2	3497.79	6686.1731	0.00029	0.05254
58	59.787	-9	-24	3513.03	8814.0928	0.00037	0.06866
59	59.359	-9	-24	3528.47	8814.0928	0.00037	0.06806
60	58.935	-8.3	-23.3	3544.10	10355.6560	0.00043	0.07926
61	58.515	-8.3	-23.3	3559.92	10355.6560	0.00043	0.07856
62	58.098	-8.3	-23.3	3575.94	10355.6560	0.00042	0.07786
63	57.685	-8	-23	3592.14	11096.2854	0.00045	0.08267
64	57.276	-8	-23	3608.52	11096.2854	0.00044	0.08192

ARL **99.6** *Max gain (dBd):* **15**

Max exposure: **0.00072412** *mW/cm²*

Max ERP(W): **2214** *Ant type:* **Antel BCR-80015**

Feet from site: **821**

RF Exposure Levels

<i>Feet to Ant. base</i>	<i>Depress angle</i>	<i>Antenna gain</i>	<i>dB from max ERP</i>	<i>Prop dist in cm</i>	<i>Act ERP in mW</i>	<i>Level mW/cm²</i>	<i>Percent of FCC STD</i>
65	56.871	-8.3	-23.3	3625.09	10355.6560	0.00041	0.07576
66	56.470	-8.3	-23.3	3641.84	10355.6560	0.00041	0.07506
67	56.072	-8.3	-23.3	3658.76	10355.6560	0.00040	0.07437
68	55.677	-9	-24	3675.86	8814.0928	0.00034	0.06271
69	55.287	-9	-24	3693.13	8814.0928	0.00034	0.06213
70	54.900	-10	-25	3710.58	7001.2827	0.00027	0.04889
71	54.517	-10	-25	3728.19	7001.2827	0.00026	0.04843
72	54.137	-10	-25	3745.96	7001.2827	0.00026	0.04797
73	53.761	-11.9	-26.9	3763.90	4520.4078	0.00017	0.03068
74	53.389	-11.9	-26.9	3782.00	4520.4078	0.00016	0.03038
75	53.020	-11.9	-26.9	3800.25	4520.4078	0.00016	0.03009
76	52.654	-13.7	-28.7	3818.67	2986.6038	0.00011	0.01969
77	52.293	-13.7	-28.7	3837.23	2986.6038	0.00011	0.01950
78	51.934	-17.1	-32.1	3855.95	1365.1413	0.00005	0.00883
79	51.580	-17.1	-32.1	3874.82	1365.1413	0.00005	0.00874
80	51.228	-17.1	-32.1	3893.83	1365.1413	0.00005	0.00866
81	50.880	-19.8	-34.8	3912.99	733.1243	0.00002	0.00460
82	50.536	-19.8	-34.8	3932.29	733.1243	0.00002	0.00456
83	50.194	-19.8	-34.8	3951.74	733.1243	0.00002	0.00451
84	49.857	-19.4	-34.4	3971.32	803.8548	0.00003	0.00490
85	49.522	-19.4	-34.4	3991.04	803.8548	0.00003	0.00485
86	49.191	-19.4	-34.4	4010.89	803.8548	0.00003	0.00480
87	48.863	-16.4	-31.4	4030.88	1603.9012	0.00005	0.00949
88	48.538	-16.4	-31.4	4050.99	1603.9012	0.00005	0.00940
89	48.217	-16.4	-31.4	4071.24	1603.9012	0.00005	0.00930
90	47.899	-13.4	-28.4	4091.61	3200.2037	0.00010	0.01838
91	47.583	-13.4	-28.4	4112.11	3200.2037	0.00010	0.01819
92	47.272	-13.4	-28.4	4132.73	3200.2037	0.00010	0.01801
93	46.963	-11.2	-26.2	4153.47	5311.0161	0.00016	0.02960
94	46.657	-11.2	-26.2	4174.33	5311.0161	0.00016	0.02930
95	46.354	-11.2	-26.2	4195.31	5311.0161	0.00016	0.02901
96	46.054	-11.2	-26.2	4216.41	5311.0161	0.00016	0.02872
97	45.758	-10.1	-25.1	4237.61	6841.9141	0.00020	0.03663
98	45.464	-10.1	-25.1	4258.94	6841.9141	0.00020	0.03626
99	45.173	-10.1	-25.1	4280.37	6841.9141	0.00019	0.03590

ARL **99.6** *Max gain (dBd):* **15**

Max exposure: **0.00072412** *mW/cm²*

Max ERP(W): **2214** *Ant type:* Antel BCR-80015

Feet from site: **821**

RF Exposure Levels

<i>Feet to Ant. base</i>	<i>Depress angle</i>	<i>Antenna gain</i>	<i>dB from max ERP</i>	<i>Prop dist in cm</i>	<i>Act ERP in mW</i>	<i>Level mW/cm²</i>	<i>Percent of FCC STD</i>
100	44.885	-8.3	-23.3	4301.91	10355.6560	0.00029	0.05380
101	44.600	-8.3	-23.3	4323.56	10355.6560	0.00029	0.05326
102	44.318	-8.3	-23.3	4345.32	10355.6560	0.00029	0.05273
103	44.039	-8.3	-23.3	4367.17	10355.6560	0.00028	0.05220
104	43.762	-7	-22	4389.14	13969.3956	0.00038	0.06971
105	43.488	-7	-22	4411.20	13969.3956	0.00037	0.06902
106	43.217	-7	-22	4433.36	13969.3956	0.00037	0.06833
107	42.949	-5.5	-20.5	4455.63	19732.2958	0.00052	0.09556
108	42.683	-5.5	-20.5	4477.98	19732.2958	0.00051	0.09460
109	42.420	-5.5	-20.5	4500.44	19732.2958	0.00051	0.09366
110	42.159	-5.5	-20.5	4522.99	19732.2958	0.00050	0.09273
111	41.902	-4.6	-19.6	4545.63	24276.0273	0.00061	0.11295
112	41.646	-4.6	-19.6	4568.36	24276.0273	0.00061	0.11183
113	41.393	-4.6	-19.6	4591.18	24276.0273	0.00060	0.11072
114	41.143	-4.6	-19.6	4614.09	24276.0273	0.00060	0.10962
115	40.895	-4.2	-19.2	4637.08	26618.1346	0.00065	0.11901
116	40.650	-4.2	-19.2	4660.17	26618.1346	0.00064	0.11783
117	40.407	-4.2	-19.2	4683.34	26618.1346	0.00063	0.11667
118	40.167	-4.2	-19.2	4706.59	26618.1346	0.00063	0.11552
119	39.928	-4.4	-19.4	4729.92	25420.1212	0.00059	0.10924
120	39.693	-4.4	-19.4	4753.33	25420.1212	0.00059	0.10816
121	39.459	-4.4	-19.4	4776.83	25420.1212	0.00058	0.10710
122	39.228	-4.4	-19.4	4800.40	25420.1212	0.00058	0.10605
123	38.999	-5.2	-20.2	4824.05	21143.5359	0.00047	0.08735
124	38.772	-5.2	-20.2	4847.77	21143.5359	0.00047	0.08649
125	38.548	-5.2	-20.2	4871.57	21143.5359	0.00047	0.08565
126	38.326	-5.2	-20.2	4895.45	21143.5359	0.00046	0.08482
127	38.105	-5.2	-20.2	4919.40	21143.5359	0.00046	0.08399
128	37.887	-6.3	-21.3	4943.42	16412.6087	0.00035	0.06457
129	37.671	-6.3	-21.3	4967.51	16412.6087	0.00035	0.06394
130	37.458	-6.3	-21.3	4991.67	16412.6087	0.00034	0.06333
131	37.246	-6.3	-21.3	5015.90	16412.6087	0.00034	0.06272
132	37.036	-6.3	-21.3	5040.19	16412.6087	0.00034	0.06211
133	36.829	-9.7	-24.7	5064.56	7502.0096	0.00015	0.02812
134	36.623	-9.7	-24.7	5088.99	7502.0096	0.00015	0.02785
135	36.419	-9.7	-24.7	5113.48	7502.0096	0.00015	0.02758
136	36.217	-9.7	-24.7	5138.04	7502.0096	0.00015	0.02732
137	36.017	-9.7	-24.7	5162.66	7502.0096	0.00015	0.02706
138	35.819	-17.1	-32.1	5187.35	1365.1413	0.00003	0.00488
139	35.623	-17.1	-32.1	5212.09	1365.1413	0.00003	0.00483

ARL **99.6** **Max gain (dBd):** **15**

Max exposure: **0.00072412** **mW/cm²**

Max ERP(W): **2214** **Ant type:** Antel BCR-80015

Feet from site: **821**

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
140	35.429	-17.1	-32.1	5236.90	1365.1413	0.00003	0.00479
141	35.237	-17.1	-32.1	5261.77	1365.1413	0.00003	0.00474
142	35.046	-17.1	-32.1	5286.69	1365.1413	0.00003	0.00470
143	34.857	-21.6	-36.6	5311.67	484.3704	0.00001	0.00165
144	34.670	-21.6	-36.6	5336.71	484.3704	0.00001	0.00164
145	34.485	-21.6	-36.6	5361.81	484.3704	0.00001	0.00162
146	34.301	-21.6	-36.6	5386.96	484.3704	0.00001	0.00160
147	34.120	-21.6	-36.6	5412.17	484.3704	0.00001	0.00159
148	33.939	-12.6	-27.6	5437.43	3847.4910	0.00007	0.01251
149	33.761	-12.6	-27.6	5462.74	3847.4910	0.00007	0.01240
150	33.584	-12.6	-27.6	5488.11	3847.4910	0.00007	0.01228
151	33.409	-12.6	-27.6	5513.52	3847.4910	0.00007	0.01217
152	33.235	-12.6	-27.6	5538.99	3847.4910	0.00007	0.01206
153	33.063	-12.6	-27.6	5564.51	3847.4910	0.00006	0.01195
154	32.893	-9.8	-24.8	5590.08	7331.2430	0.00012	0.02255
155	32.724	-9.8	-24.8	5615.70	7331.2430	0.00012	0.02235
156	32.557	-9.8	-24.8	5641.37	7331.2430	0.00012	0.02215
157	32.391	-9.8	-24.8	5667.08	7331.2430	0.00012	0.02195
158	32.227	-9.8	-24.8	5692.84	7331.2430	0.00012	0.02175
159	32.064	-9.8	-24.8	5718.65	7331.2430	0.00012	0.02155
160	31.902	-8.7	-23.7	5744.50	9444.4705	0.00015	0.02751
161	31.742	-8.7	-23.7	5770.40	9444.4705	0.00015	0.02727
162	31.584	-8.7	-23.7	5796.34	9444.4705	0.00015	0.02702
163	31.427	-8.7	-23.7	5822.33	9444.4705	0.00015	0.02678
164	31.271	-8.7	-23.7	5848.36	9444.4705	0.00014	0.02655
165	31.117	-8.7	-23.7	5874.43	9444.4705	0.00014	0.02631
166	30.964	-9.2	-24.2	5900.55	8417.3932	0.00013	0.02324
167	30.812	-9.2	-24.2	5926.71	8417.3932	0.00013	0.02304
168	30.662	-9.2	-24.2	5952.91	8417.3932	0.00012	0.02284
169	30.513	-9.2	-24.2	5979.14	8417.3932	0.00012	0.02264
170	30.365	-9.2	-24.2	6005.42	8417.3932	0.00012	0.02244
171	30.219	-9.2	-24.2	6031.74	8417.3932	0.00012	0.02224
172	30.074	-9.2	-24.2	6058.10	8417.3932	0.00012	0.02205
173	29.930	-12.2	-27.2	6084.50	4218.6900	0.00006	0.01096
174	29.787	-12.2	-27.2	6110.93	4218.6900	0.00006	0.01086
175	29.646	-12.2	-27.2	6137.40	4218.6900	0.00006	0.01077
176	29.506	-12.2	-27.2	6163.91	4218.6900	0.00006	0.01067
177	29.367	-12.2	-27.2	6190.45	4218.6900	0.00006	0.01058
178	29.229	-12.2	-27.2	6217.04	4218.6900	0.00006	0.01049
179	29.093	-12.2	-27.2	6243.65	4218.6900	0.00006	0.01040

ARL **99.6** **Max gain (dBd): 15**

Max exposure: 0.00072412 mW/cm²

Max ERP(W): 2214 Ant type: Antel BCR-80015 Feet from site: 821

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
180	28.957	-23	-38	6270.30	350.8954	0.00000	0.00086
181	28.823	-23	-38	6296.99	350.8954	0.00000	0.00085
182	28.690	-23	-38	6323.71	350.8954	0.00000	0.00084
183	28.558	-23	-38	6350.47	350.8954	0.00000	0.00084
184	28.427	-23	-38	6377.26	350.8954	0.00000	0.00083
185	28.297	-23	-38	6404.08	350.8954	0.00000	0.00082
186	28.168	-23	-38	6430.93	350.8954	0.00000	0.00082
187	28.041	-23	-38	6457.82	350.8954	0.00000	0.00081
188	27.914	-22.4	-37.4	6484.73	402.8818	0.00001	0.00092
189	27.789	-22.4	-37.4	6511.68	402.8818	0.00000	0.00091
190	27.664	-22.4	-37.4	6538.66	402.8818	0.00000	0.00091
191	27.541	-22.4	-37.4	6565.68	402.8818	0.00000	0.00090
201	26.359	-11.4	-26.4	6837.39	5071.9810	0.00006	0.01043
211	25.269	-7.3	-22.3	7111.79	13036.9985	0.00013	0.02478
221	24.260	-5.8	-20.8	7388.57	18415.2499	0.00018	0.03243
231	23.324	-4.6	-19.6	7667.47	24276.0273	0.00022	0.03970
241	22.454	-4.6	-19.6	7948.28	24276.0273	0.00020	0.03694
251	21.644	-5	-20	8230.79	22140.0000	0.00017	0.03142
261	20.887	-6.9	-21.9	8514.85	14294.7846	0.00010	0.01895
271	20.180	-6.9	-21.9	8800.29	14294.7846	0.00010	0.01775
281	19.517	-9.4	-24.4	9086.99	8038.5481	0.00005	0.00936
291	18.894	-18.9	-33.9	9374.83	901.9399	0.00001	0.00099
301	18.309	-18.9	-33.9	9663.71	901.9399	0.00001	0.00093
311	17.758	-17.1	-32.1	9953.54	1365.1413	0.00001	0.00132
321	17.238	-17.1	-32.1	10244.24	1365.1413	0.00001	0.00125
331	16.747	-10.3	-25.3	10535.73	6533.9772	0.00003	0.00566
341	16.282	-10.3	-25.3	10827.96	6533.9772	0.00003	0.00536
351	15.842	-6.1	-21.1	11120.86	17186.1112	0.00007	0.01336
361	15.424	-6.1	-21.1	11414.39	17186.1112	0.00007	0.01268
371	15.027	-6.1	-21.1	11708.49	17186.1112	0.00007	0.01205
381	14.650	-4.9	-19.9	12003.13	22655.7068	0.00008	0.01512
391	14.291	-4.9	-19.9	12298.26	22655.7068	0.00008	0.01440
401	13.949	-4.7	-19.7	12593.85	23723.4374	0.00008	0.01438
411	13.622	-4.7	-19.7	12889.87	23723.4374	0.00007	0.01373
421	13.310	-4.7	-19.7	13186.30	23723.4374	0.00007	0.01312
431	13.012	-4.7	-19.7	13483.09	23723.4374	0.00007	0.01255
441	12.727	-5.1	-20.1	13780.24	21636.0321	0.00006	0.01095
451	12.453	-5.1	-20.1	14077.71	21636.0321	0.00006	0.01050
461	12.191	-5.1	-20.1	14375.49	21636.0321	0.00005	0.01007
471	11.940	-4.5	-19.5	14673.55	24841.4886	0.00006	0.01109

ARL **99.6** **Max gain (dBd): 15**

Max exposure: 0.00072412 mW/cm²

Max ERP(W): 2214 Ant type: Antel BCR-80015 Feet from site: 821

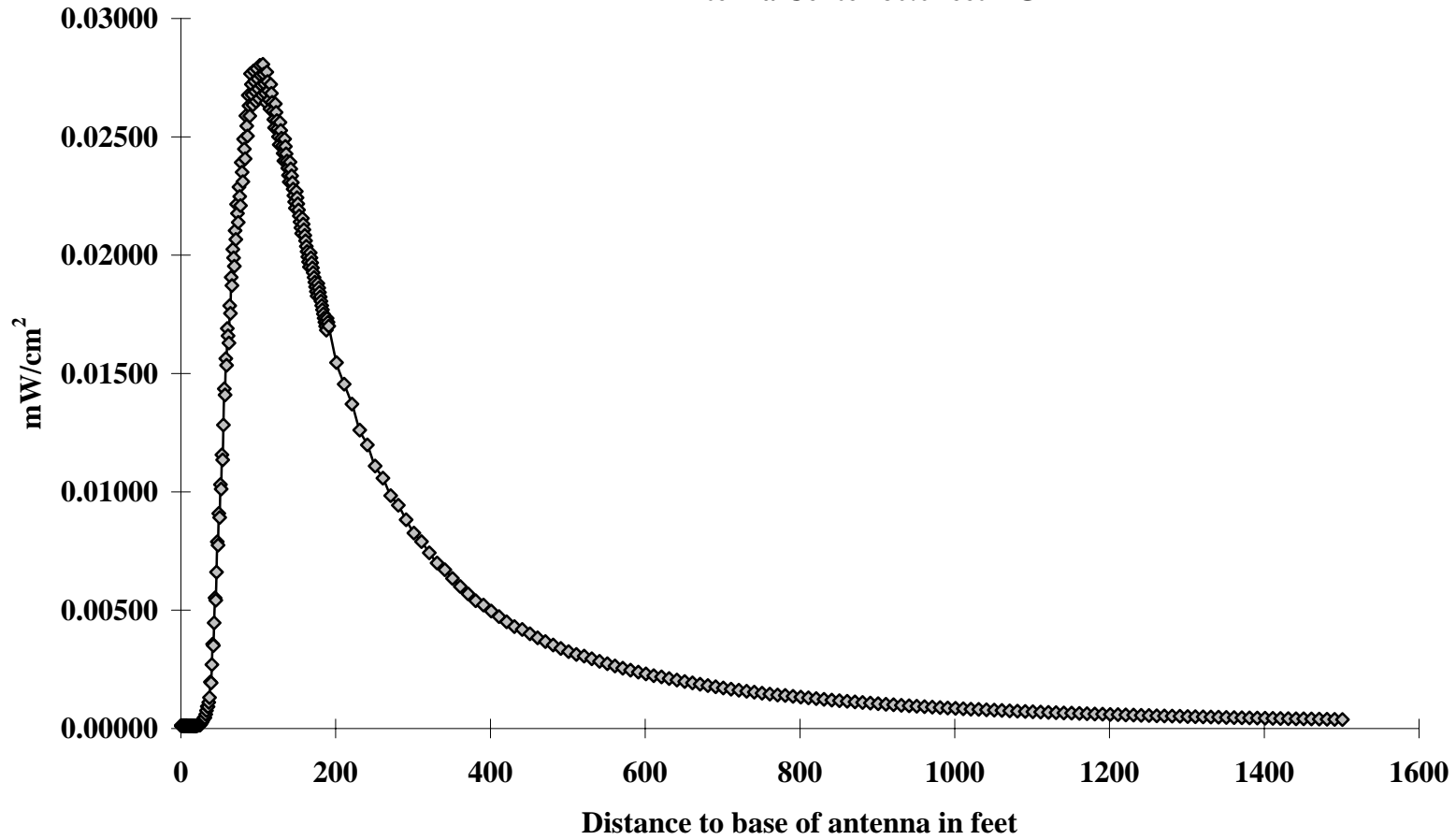
RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
481	11.699	-4.5	-19.5	14971.89	24841.4886	0.00006	0.01065
491	11.467	-4.5	-19.5	15270.48	24841.4886	0.00006	0.01024
501	11.244	-4.5	-19.5	15569.32	24841.4886	0.00005	0.00985
511	11.029	-4.5	-19.5	15868.38	24841.4886	0.00005	0.00948
521	10.823	-2.1	-17.1	16167.66	43169.5594	0.00009	0.01588
531	10.624	-2.1	-17.1	16467.13	43169.5594	0.00008	0.01531
541	10.432	-2.1	-17.1	16766.80	43169.5594	0.00008	0.01476
551	10.246	-2.1	-17.1	17066.65	43169.5594	0.00008	0.01425
561	10.067	-2.1	-17.1	17366.68	43169.5594	0.00007	0.01376
571	9.895	2.6	-12.4	17666.87	127402.4021	0.00021	0.03924
581	9.728	2.6	-12.4	17967.21	127402.4021	0.00021	0.03794
591	9.566	2.6	-12.4	18267.70	127402.4021	0.00020	0.03670
601	9.410	2.6	-12.4	18568.33	127402.4021	0.00019	0.03552
611	9.258	2.6	-12.4	18869.09	127402.4021	0.00019	0.03440
621	9.112	2.6	-12.4	19169.99	127402.4021	0.00018	0.03333
631	8.970	6.4	-8.6	19471.00	305617.0762	0.00042	0.07750
641	8.832	6.4	-8.6	19772.13	305617.0762	0.00041	0.07516
651	8.699	6.4	-8.6	20073.37	305617.0762	0.00040	0.07292
661	8.569	6.4	-8.6	20374.72	305617.0762	0.00038	0.07078
671	8.443	6.4	-8.6	20676.16	305617.0762	0.00037	0.06873
681	8.321	6.4	-8.6	20977.71	305617.0762	0.00036	0.06677
691	8.202	6.4	-8.6	21279.34	305617.0762	0.00035	0.06489
701	8.087	6.4	-8.6	21581.07	305617.0762	0.00034	0.06308
711	7.974	8.6	-6.4	21882.88	507198.0983	0.00055	0.10183
721	7.865	8.6	-6.4	22184.77	507198.0983	0.00054	0.09907
731	7.759	8.6	-6.4	22486.75	507198.0983	0.00052	0.09643
741	7.655	8.6	-6.4	22788.79	507198.0983	0.00051	0.09389
751	7.555	8.6	-6.4	23090.91	507198.0983	0.00050	0.09145
761	7.457	8.6	-6.4	23393.10	507198.0983	0.00048	0.08910
771	7.361	8.6	-6.4	23695.36	507198.0983	0.00047	0.08685
781	7.268	8.6	-6.4	23997.68	507198.0983	0.00046	0.08467
791	7.177	8.6	-6.4	24300.06	507198.0983	0.00045	0.08258
801	7.088	8.6	-6.4	24602.50	507198.0983	0.00044	0.08056
811	7.002	8.6	-6.4	24905.00	507198.0983	0.00043	0.07861
821	6.917	11	-4	25207.55	881409.2756	0.00072	0.13336
831	6.835	11	-4	25510.16	881409.2756	0.00071	0.13021
841	6.754	11	-4	25812.82	881409.2756	0.00069	0.12717
851	6.675	11	-4	26115.53	881409.2756	0.00067	0.12424
861	6.599	11	-4	26418.29	881409.2756	0.00066	0.12141
871	6.524	11	-4	26721.09	881409.2756	0.00064	0.11868

Appendix A-2

**Kathrein-Scala Model CL7-150/URM
Exposure Calculation 6.0 ft AGL
Antenna Center 60.0 ft
ERP 1,557 Watts (147-174 MHz)**

**Kathrein-Scala (147-174 MHz) RF exposure levels AGL= 6 feet
RF Antenna Center 60.0 feet AGL**



ARL 54 **Max gain (dBd):** 7.3 **Max exposure:** 0.02806305 **mW/cm²**

Max ERP(W): 1557 **Ant type:** Kathrein-Scala CL7-150/URM **Feet from site:** 106

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
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0	90.000	-26.68	-33.98	1645.92	622.7140	0.00012	0.06000
1	88.939	-26.68	-33.98	1646.20	622.7140	0.00012	0.05998
2	87.879	-26.68	-33.98	1647.05	622.7140	0.00012	0.05992
3	86.820	-26.68	-33.98	1648.46	622.7140	0.00012	0.05981
4	85.764	-26.68	-33.98	1650.43	622.7140	0.00012	0.05967
5	84.710	-26.68	-33.98	1652.96	622.7140	0.00012	0.05949
6	83.660	-26.68	-33.98	1656.05	622.7140	0.00012	0.05927
7	82.614	-26.68	-33.98	1659.69	622.7140	0.00012	0.05901
8	81.573	-26.68	-33.98	1663.88	622.7140	0.00012	0.05871
9	80.538	-26.68	-33.98	1668.62	622.7140	0.00012	0.05838
10	79.509	-26.68	-33.98	1673.90	622.7140	0.00012	0.05801
11	78.486	-26.68	-33.98	1679.72	622.7140	0.00012	0.05761
12	77.471	-26.68	-33.98	1686.07	622.7140	0.00011	0.05717
13	76.464	-26.68	-33.98	1692.94	622.7140	0.00011	0.05671
14	75.466	-26.68	-33.98	1700.34	622.7140	0.00011	0.05622
15	74.476	-26.68	-33.98	1708.24	622.7140	0.00011	0.05570
16	73.496	-26.68	-33.98	1716.65	622.7140	0.00011	0.05516
17	72.525	-26.68	-33.98	1725.56	622.7140	0.00011	0.05459
18	71.565	-26.68	-33.98	1734.95	622.7140	0.00011	0.05400
19	70.615	-26.68	-33.98	1744.83	622.7140	0.00011	0.05339
20	69.677	-26.26	-33.56	1755.18	685.9439	0.00012	0.05812
21	68.749	-25.85	-33.15	1766.00	753.8564	0.00013	0.06309
22	67.834	-25.47	-32.77	1777.27	822.7893	0.00014	0.06799
23	66.930	-25.1	-32.4	1789.00	895.9600	0.00015	0.07307
24	66.038	-25.1	-32.4	1801.16	895.9600	0.00014	0.07209
25	65.158	-24.74	-32.04	1813.75	973.3939	0.00015	0.07723
26	64.290	-23.45	-30.75	1826.77	1310.0522	0.00020	0.10247
27	63.435	-22.33	-29.63	1840.19	1695.4642	0.00026	0.13068
28	62.592	-21.34	-28.64	1854.03	2129.5538	0.00032	0.16170
29	61.763	-20.44	-27.74	1868.25	2619.9235	0.00039	0.19592
30	60.945	-19.64	-26.94	1882.86	3149.8409	0.00046	0.23191

ARL 54 **Max gain (dBd):** 7.3 **Max exposure:** 0.02806305 **mW/cm²**

Max ERP(W): 1557 **Ant type:** Kathrein-Scala CL7-150/URM **Feet from site:** 106

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
31	60.141	-19.64	-26.94	1897.85	3149.8409	0.00046	0.22826
32	59.349	-18.38	-25.68	1913.21	4210.0632	0.00060	0.30021
33	58.570	-17.28	-24.58	1928.93	5423.6120	0.00076	0.38047
34	57.804	-16.31	-23.61	1945.00	6780.9199	0.00094	0.46786
35	57.051	-16.31	-23.61	1961.41	6780.9199	0.00092	0.46006
36	56.310	-15.43	-22.73	1978.15	8304.0243	0.00111	0.55390
37	55.582	-14.64	-21.94	1995.22	9960.6714	0.00131	0.65309
38	54.866	-12.79	-20.09	2012.60	15250.6591	0.00197	0.98273
39	54.162	-12.79	-20.09	2030.30	15250.6591	0.00193	0.96568
40	53.471	-11.26	-18.56	2048.29	21691.4514	0.00270	1.34949
41	52.792	-9.97	-17.27	2066.58	29193.6645	0.00357	1.78422
42	52.125	-9.97	-17.27	2085.15	29193.6645	0.00351	1.75258
43	51.470	-8.84	-16.14	2104.00	37869.4164	0.00447	2.23285
44	50.826	-7.84	-15.14	2123.12	47674.7707	0.00552	2.76059
45	50.194	-7.84	-15.14	2142.51	47674.7707	0.00542	2.71086
46	49.574	-6.9	-14.2	2162.15	59195.4890	0.00661	3.30508
47	48.965	-6.05	-13.35	2182.04	71992.7250	0.00789	3.94665
48	48.366	-6.05	-13.35	2202.17	71992.7250	0.00775	3.87483
49	47.779	-5.28	-12.58	2222.53	85958.4573	0.00908	4.54209
50	47.203	-5.28	-12.58	2243.13	85958.4573	0.00892	4.45907
51	46.637	-4.57	-11.87	2263.95	101225.1928	0.01031	5.15489
52	46.081	-4.57	-11.87	2284.98	101225.1928	0.01012	5.06042
53	45.535	-3.91	-11.21	2306.23	117838.8818	0.01157	5.78292
54	45.000	-3.91	-11.21	2327.68	117838.8818	0.01135	5.67682
55	44.474	-3.3	-10.6	2349.33	135609.0310	0.01283	6.41303
56	43.958	-2.73	-10.03	2371.18	154628.1687	0.01436	7.17834
57	43.452	-2.73	-10.03	2393.21	154628.1687	0.01409	7.04676
58	42.955	-2.2	-9.5	2415.43	174698.2733	0.01563	7.81561
59	42.466	-2.2	-9.5	2437.83	174698.2733	0.01535	7.67267
60	41.987	-1.7	-9	2460.40	196014.6866	0.01690	8.45165
61	41.517	-1.7	-9	2483.14	196014.6866	0.01660	8.29757
62	41.055	-1.7	-9	2506.04	196014.6866	0.01629	8.14659
63	40.601	-1.22	-8.52	2529.11	218921.5995	0.01787	8.93344
64	40.156	-1.22	-8.52	2552.32	218921.5995	0.01754	8.77164

ARL 54 **Max gain (dBd):** 7.3

Max exposure: 0.02806305 **mW/cm²**

Max ERP(W): 1557 **Ant type:** Kathrein-Scala CL7-150/URM **Feet from site:** 106

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
65	39.719	-0.78	-8.08	2575.70	242263.8488	0.01906	9.53155
66	39.289	-0.78	-8.08	2599.21	242263.8488	0.01872	9.35985
67	38.868	-0.36	-7.66	2622.87	266863.1528	0.02025	10.12506
68	38.454	-0.36	-7.66	2646.68	266863.1528	0.01989	9.94378
69	38.047	-0.36	-7.66	2670.61	266863.1528	0.01953	9.76632
70	37.648	0.04	-7.26	2694.68	292609.6284	0.02104	10.51812
71	37.255	0.04	-7.26	2718.88	292609.6284	0.02066	10.33174
72	36.870	0.42	-6.88	2743.20	319365.9512	0.02215	11.07740
73	36.491	0.42	-6.88	2767.64	319365.9512	0.02177	10.88258
74	36.119	0.42	-6.88	2792.21	319365.9512	0.02138	10.69196
75	35.754	0.79	-6.51	2816.89	347767.1951	0.02288	11.43968
76	35.395	0.79	-6.51	2841.68	347767.1951	0.02248	11.24095
77	35.042	0.79	-6.51	2866.58	347767.1951	0.02209	11.04650
78	34.695	1.21	-6.09	2891.59	383079.2360	0.02392	11.95859
79	34.354	1.21	-6.09	2916.70	383079.2360	0.02351	11.75356
80	34.019	1.21	-6.09	2941.91	383079.2360	0.02311	11.55296
81	33.690	1.61	-5.69	2967.22	420038.0296	0.02490	12.45236
82	33.366	1.61	-5.69	2992.63	420038.0296	0.02448	12.24181
83	33.048	1.61	-5.69	3018.14	420038.0296	0.02407	12.03580
84	32.735	2	-5.3	3043.73	459503.2766	0.02589	12.94614
85	32.428	2	-5.3	3069.41	459503.2766	0.02546	12.73040
86	32.125	2	-5.3	3095.18	459503.2766	0.02504	12.51929
87	31.827	2.36	-4.94	3121.04	499216.1338	0.02675	13.37686
88	31.535	2.36	-4.94	3146.98	499216.1338	0.02631	13.15726
89	31.247	2.36	-4.94	3173.00	499216.1338	0.02588	12.94236
90	30.964	2.72	-4.58	3199.09	542361.1995	0.02766	13.83244
91	30.685	2.72	-4.58	3225.27	542361.1995	0.02722	13.60884
92	30.411	2.72	-4.58	3251.52	542361.1995	0.02678	13.38999
93	30.141	2.72	-4.58	3277.84	542361.1995	0.02635	13.17580
94	29.876	3.02	-4.28	3304.23	581150.4957	0.02779	13.89348
95	29.615	3.02	-4.28	3330.70	581150.4957	0.02735	13.67357
96	29.358	3.02	-4.28	3357.23	581150.4957	0.02692	13.45830
97	29.105	3.02	-4.28	3383.83	581150.4957	0.02650	13.24756
98	28.856	3.31	-3.99	3410.49	621281.7730	0.02788	13.94178
99	28.610	3.31	-3.99	3437.22	621281.7730	0.02745	13.72581

ARL 54 **Max gain (dBd):** 7.3 **Max exposure:** 0.02806305 **mW/cm²**

Max ERP(W): 1557 **Ant type:** Kathrein-Scala CL7-150/URM **Feet from site:** 106

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
100	28.369	3.31	-3.99	3464.01	621281.7730	0.02703	13.51433
101	28.131	3.31	-3.99	3490.86	621281.7730	0.02661	13.30724
102	27.897	3.6	-3.7	3517.77	664184.3108	0.02802	14.00936
103	27.667	3.6	-3.7	3544.73	664184.3108	0.02759	13.79702
104	27.440	3.6	-3.7	3571.76	664184.3108	0.02718	13.58904
105	27.216	3.6	-3.7	3598.83	664184.3108	0.02677	13.38532
106	26.996	3.87	-3.43	3625.97	706787.0971	0.02806	14.03152
107	26.779	3.87	-3.43	3653.15	706787.0971	0.02765	13.82347
108	26.565	3.87	-3.43	3680.39	706787.0971	0.02724	13.61962
109	26.354	3.87	-3.43	3707.68	706787.0971	0.02684	13.41989
110	26.147	3.87	-3.43	3735.01	706787.0971	0.02645	13.22417
111	25.942	4.14	-3.16	3762.40	752122.5548	0.02774	13.86830
112	25.741	4.14	-3.16	3789.83	752122.5548	0.02734	13.66826
113	25.542	4.14	-3.16	3817.31	752122.5548	0.02694	13.47219
114	25.346	4.14	-3.16	3844.83	752122.5548	0.02656	13.27999
115	25.153	4.14	-3.16	3872.40	752122.5548	0.02618	13.09158
116	24.963	4.37	-2.93	3900.01	793028.1662	0.02722	13.60883
117	24.775	4.37	-2.93	3927.66	793028.1662	0.02684	13.41788
118	24.590	4.37	-2.93	3955.36	793028.1662	0.02646	13.23063
119	24.408	4.37	-2.93	3983.10	793028.1662	0.02609	13.04701
120	24.228	4.37	-2.93	4010.87	793028.1662	0.02573	12.86693
121	24.050	4.37	-2.93	4038.69	793028.1662	0.02538	12.69031
122	23.875	4.6	-2.7	4066.54	836158.5069	0.02640	13.19783
123	23.703	4.6	-2.7	4094.43	836158.5069	0.02604	13.01864
124	23.532	4.6	-2.7	4122.36	836158.5069	0.02569	12.84285
125	23.364	4.6	-2.7	4150.32	836158.5069	0.02534	12.67038
126	23.199	4.6	-2.7	4178.32	836158.5069	0.02500	12.50114
127	23.035	4.6	-2.7	4206.35	836158.5069	0.02467	12.33507
128	22.874	4.82	-2.48	4234.42	879606.8698	0.02561	12.80458
129	22.714	4.82	-2.48	4262.52	879606.8698	0.02527	12.63631
130	22.557	4.82	-2.48	4290.65	879606.8698	0.02494	12.47115
131	22.402	4.82	-2.48	4318.81	879606.8698	0.02462	12.30903
132	22.249	4.82	-2.48	4347.01	879606.8698	0.02430	12.14987
133	22.098	4.82	-2.48	4375.23	879606.8698	0.02399	11.99361
134	21.949	5.04	-2.26	4403.49	925312.8910	0.02491	12.45543
135	21.801	5.04	-2.26	4431.78	925312.8910	0.02459	12.29694
136	21.656	5.04	-2.26	4460.09	925312.8910	0.02428	12.14131
137	21.512	5.04	-2.26	4488.43	925312.8910	0.02398	11.98846
138	21.371	5.04	-2.26	4516.80	925312.8910	0.02368	11.83833
139	21.231	5.04	-2.26	4545.20	925312.8910	0.02338	11.69086

ARL 54 **Max gain (dBd):** 7.3 **Max exposure:** 0.02806305 **mW/cm²**

Max ERP(W): 1557 **Ant type:** Kathrein-Scala CL7-150/URM **Feet from site:** 106

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
140	21.092	5.04	-2.26	4573.63	925312.8910	0.02309	11.54600
141	20.956	5.25	-2.05	4602.08	971155.1388	0.02394	11.96864
142	20.821	5.25	-2.05	4630.55	971155.1388	0.02364	11.82189
143	20.688	5.25	-2.05	4659.06	971155.1388	0.02336	11.67769
144	20.556	5.25	-2.05	4687.58	971155.1388	0.02307	11.53599
145	20.426	5.25	-2.05	4716.13	971155.1388	0.02279	11.39673
146	20.298	5.25	-2.05	4744.71	971155.1388	0.02252	11.25987
147	20.171	5.25	-2.05	4773.31	971155.1388	0.02225	11.12535
148	20.045	5.25	-2.05	4801.93	971155.1388	0.02199	10.99312
149	19.921	5.44	-1.86	4830.58	1014585.4096	0.02270	11.34893
150	19.799	5.44	-1.86	4859.24	1014585.4096	0.02243	11.21542
151	19.678	5.44	-1.86	4887.93	1014585.4096	0.02217	11.08415
152	19.558	5.44	-1.86	4916.64	1014585.4096	0.02191	10.95508
153	19.440	5.44	-1.86	4945.37	1014585.4096	0.02166	10.82815
154	19.323	5.44	-1.86	4974.13	1014585.4096	0.02141	10.70333
155	19.208	5.44	-1.86	5002.90	1014585.4096	0.02116	10.58057
156	19.093	5.44	-1.86	5031.69	1014585.4096	0.02092	10.45982
157	18.981	5.62	-1.68	5060.51	1057520.0560	0.02156	10.77866
158	18.869	5.62	-1.68	5089.34	1057520.0560	0.02131	10.65688
159	18.759	5.62	-1.68	5118.19	1057520.0560	0.02107	10.53707
160	18.650	5.62	-1.68	5147.06	1057520.0560	0.02084	10.41919
161	18.542	5.62	-1.68	5175.95	1057520.0560	0.02061	10.30321
162	18.435	5.62	-1.68	5204.86	1057520.0560	0.02038	10.18908
163	18.329	5.62	-1.68	5233.78	1057520.0560	0.02015	10.07677
164	18.225	5.62	-1.68	5262.72	1057520.0560	0.01993	9.96624
165	18.122	5.62	-1.68	5291.68	1057520.0560	0.01971	9.85746
166	18.020	5.62	-1.68	5320.66	1057520.0560	0.01950	9.75038
167	17.919	5.8	-1.5	5349.65	1102271.5863	0.02011	10.05313
168	17.819	5.8	-1.5	5378.66	1102271.5863	0.01989	9.94498
169	17.720	5.8	-1.5	5407.69	1102271.5863	0.01968	9.83851
170	17.622	5.8	-1.5	5436.73	1102271.5863	0.01947	9.73368
171	17.526	5.8	-1.5	5465.79	1102271.5863	0.01926	9.63046
172	17.430	5.8	-1.5	5494.86	1102271.5863	0.01906	9.52882
173	17.335	5.8	-1.5	5523.95	1102271.5863	0.01886	9.42873
174	17.241	5.8	-1.5	5553.05	1102271.5863	0.01866	9.33016
175	17.149	5.8	-1.5	5582.17	1102271.5863	0.01847	9.23308
176	17.057	5.8	-1.5	5611.30	1102271.5863	0.01827	9.13746
177	16.966	5.97	-1.33	5640.45	1146274.4508	0.01881	9.40428
178	16.876	5.97	-1.33	5669.61	1146274.4508	0.01862	9.30779
179	16.787	5.97	-1.33	5698.78	1146274.4508	0.01843	9.21273

ARL 54 **Max gain (dBd):** 7.3

Max exposure: 0.02806305 **mW/cm²**

Max ERP(W): 1557 **Ant type:** Kathrein-Scala CL7-150/URM **Feet from site:** 106

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
180	16.699	5.97	-1.33	5727.97	1146274.4508	0.01824	9.11908
181	16.612	5.97	-1.33	5757.17	1146274.4508	0.01805	9.02681
182	16.526	5.97	-1.33	5786.39	1146274.4508	0.01787	8.93589
183	16.440	5.97	-1.33	5815.61	1146274.4508	0.01769	8.84630
184	16.356	5.97	-1.33	5844.85	1146274.4508	0.01752	8.75801
185	16.272	5.97	-1.33	5874.11	1146274.4508	0.01734	8.67100
186	16.189	5.97	-1.33	5903.37	1146274.4508	0.01717	8.58524
187	16.107	5.97	-1.33	5932.65	1146274.4508	0.01700	8.50071
188	16.026	5.97	-1.33	5961.94	1146274.4508	0.01683	8.41739
189	15.945	6.14	-1.16	5991.24	1192033.9170	0.01734	8.66801
190	15.866	6.14	-1.16	6020.55	1192033.9170	0.01717	8.58381
191	15.787	6.14	-1.16	6049.88	1192033.9170	0.01700	8.50079
201	15.038	6.14	-1.16	6343.72	1192033.9170	0.01546	7.73151
211	14.355	6.27	-1.03	6638.56	1228255.2031	0.01455	7.27454
221	13.731	6.39	-0.91	6934.25	1262666.3671	0.01371	6.85415
231	13.158	6.39	-0.91	7230.70	1262666.3671	0.01261	6.30364
241	12.629	6.52	-0.78	7527.82	1301033.8994	0.01199	5.99258
251	12.142	6.52	-0.78	7825.53	1301033.8994	0.01109	5.54530
261	11.689	6.64	-0.66	8123.76	1337484.0530	0.01058	5.28979
271	11.269	6.64	-0.66	8422.47	1337484.0530	0.00984	4.92123
281	10.878	6.76	-0.54	8721.60	1374955.4050	0.00944	4.71803
291	10.513	6.76	-0.54	9021.10	1374955.4050	0.00882	4.40995
301	10.171	6.76	-0.54	9320.95	1374955.4050	0.00826	4.13078
311	9.850	6.84	-0.46	9621.11	1400517.7344	0.00790	3.94914
321	9.549	6.84	-0.46	9921.56	1400517.7344	0.00743	3.71358
331	9.266	6.84	-0.46	10222.26	1400517.7344	0.00700	3.49832
341	8.999	6.91	-0.39	10523.20	1423274.3170	0.00671	3.35473
351	8.746	6.91	-0.39	10824.35	1423274.3170	0.00634	3.17066
361	8.507	6.91	-0.39	11125.70	1423274.3170	0.00600	3.00122
371	8.281	6.91	-0.39	11427.24	1423274.3170	0.00569	2.84492
381	8.067	6.91	-0.39	11728.94	1423274.3170	0.00540	2.70044
391	7.863	6.98	-0.32	12030.80	1446400.6642	0.00522	2.60834
401	7.670	6.98	-0.32	12332.80	1446400.6642	0.00496	2.48215
411	7.485	6.98	-0.32	12634.94	1446400.6642	0.00473	2.36486
421	7.309	6.98	-0.32	12937.21	1446400.6642	0.00451	2.25565
431	7.141	6.98	-0.32	13239.59	1446400.6642	0.00431	2.15379
441	6.981	7.05	-0.25	13542.08	1469902.7844	0.00418	2.09210
451	6.828	7.05	-0.25	13844.67	1469902.7844	0.00400	2.00165
461	6.681	7.05	-0.25	14147.35	1469902.7844	0.00383	1.91691
471	6.540	7.05	-0.25	14450.12	1469902.7844	0.00367	1.83742

ARL 54 **Max gain (dBd):** 7.3

Max exposure: 0.02806305 **mW/cm²**

Max ERP(W): 1557 **Ant type:** Kathrein-Scala CL7-150/URM **Feet from site:** 106

RF Exposure Levels

Feet to Ant. base	Depress angle	Antenna gain	dB from max ERP	Prop dist in cm	Act ERP in mW	Level mW/cm ²	Percent of FCC STD
481	6.406	7.05	-0.25	14752.98	1469902.7844	0.00353	1.76276
491	6.276	7.05	-0.25	15055.92	1469902.7844	0.00339	1.69254
501	6.152	7.05	-0.25	15358.93	1469902.7844	0.00325	1.62641
511	6.032	7.05	-0.25	15662.00	1469902.7844	0.00313	1.56408
521	5.917	7.12	-0.18	15965.15	1493786.7833	0.00306	1.52970
531	5.807	7.12	-0.18	16268.36	1493786.7833	0.00295	1.47321
541	5.700	7.12	-0.18	16571.62	1493786.7833	0.00284	1.41979
551	5.597	7.12	-0.18	16874.94	1493786.7833	0.00274	1.36920
561	5.498	7.12	-0.18	17178.31	1493786.7833	0.00264	1.32127
571	5.402	7.12	-0.18	17481.73	1493786.7833	0.00255	1.27580
581	5.310	7.12	-0.18	17785.20	1493786.7833	0.00247	1.23264
591	5.221	7.12	-0.18	18088.72	1493786.7833	0.00238	1.19162
601	5.134	7.12	-0.18	18392.27	1493786.7833	0.00231	1.15261
611	5.051	7.12	-0.18	18695.87	1493786.7833	0.00223	1.11548
621	4.970	7.16	-0.14	18999.51	1507608.6222	0.00218	1.09010
631	4.891	7.16	-0.14	19303.18	1507608.6222	0.00211	1.05608
641	4.815	7.16	-0.14	19606.89	1507608.6222	0.00205	1.02361
651	4.742	7.16	-0.14	19910.63	1507608.6222	0.00199	0.36561
661	4.670	7.16	-0.14	20214.40	1507608.6222	0.00193	0.35470
671	4.601	7.16	-0.14	20518.20	1507608.6222	0.00187	0.34427
681	4.534	7.16	-0.14	20822.03	1507608.6222	0.00182	0.33430
691	4.468	7.16	-0.14	21125.89	1507608.6222	0.00176	0.32475
701	4.405	7.16	-0.14	21429.78	1507608.6222	0.00171	0.31561
711	4.343	7.16	-0.14	21733.69	1507608.6222	0.00167	0.30684
721	4.283	7.16	-0.14	22037.63	1507608.6222	0.00162	0.29844
731	4.225	7.16	-0.14	22341.59	1507608.6222	0.00158	0.29037
741	4.168	7.16	-0.14	22645.57	1507608.6222	0.00153	0.28263
751	4.113	7.16	-0.14	22949.58	1507608.6222	0.00149	0.27519
761	4.059	7.16	-0.14	23253.60	1507608.6222	0.00146	0.26804
771	4.006	7.16	-0.14	23557.65	1507608.6222	0.00142	0.26117
781	3.955	7.2	-0.1	23861.71	1521558.3530	0.00140	0.25691
791	3.905	7.2	-0.1	24165.80	1521558.3530	0.00136	0.25048
801	3.857	7.2	-0.1	24469.90	1521558.3530	0.00133	0.24430
811	3.809	7.2	-0.1	24774.02	1521558.3530	0.00129	0.23834
821	3.763	7.2	-0.1	25078.15	1521558.3530	0.00126	0.23259
831	3.718	7.2	-0.1	25382.30	1521558.3530	0.00123	0.22705
841	3.674	7.2	-0.1	25686.47	1521558.3530	0.00120	0.22170
851	3.631	7.2	-0.1	25990.65	1521558.3530	0.00118	0.21655
861	3.589	7.2	-0.1	26294.84	1521558.3530	0.00115	0.21156
871	3.548	7.2	-0.1	26599.05	1521558.3530	0.00112	0.20675

STATEMENT OF EXPERIENCE

Jerrold Talmadge Bushberg, Ph.D., DABMP, DABSNM
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Dr. Jerrold Bushberg has performed health and safety analysis for RF & ELF transmissions systems since 1978 and is an expert in both health physics and medical physics. He serves as Director of Health Physics Programs at the University of California at Davis, which includes the campus, medical center and 16 offsite research field stations throughout California. He is also the Director of Environmental Health and Safety for the UC Davis Health System. In addition, Dr. Bushberg holds appointments as Clinical Professor of Radiology and Clinical Professor of Radiation Oncology, at the UC Davis School of Medicine with primary responsibility for medical postgraduate courses in medical physics, radiation (ionizing and non-ionizing) protection, and radiation biology. Dr. Bushberg has extensive experience and lectures on the science of Risk Assessment and on Effective Risk Communication in the public sector.

Dr. Bushberg's doctoral dissertation at Purdue University focused on the biological effects of microwave radiation. He has maintained strong professional involvement in this subject and has served as consultant or appeared as an expert witness on this subject to a wide variety of organizations/institutions including, local governments, school districts, city planning departments, telecommunications companies, the California Public Utilities Commission, State of California, national news organizations, and the U.S. Congress. In addition, his consultation services have included detailed computer based modeling of RF exposures as well as on-site safety inspections and RF & ELF field measurements of numerous transmission facilities in order to determine their compliance with FCC and other safety regulations.

Dr. Bushberg is a member of the main scientific body of International Committee on Electromagnetic Safety (ICES) which reviews and evaluates the scientific literature on the biological effects of non-ionizing electromagnetic radiation and establishes exposure standards. He also serves on the ICES Risk Assessment Working Group that is responsible for evaluating and characterizing the risks of non-ionizing electromagnetic radiation. Dr. Bushberg was appointed and is serving as a member of the main scientific council of the National Council on Radiation Protection and Measurement's (NCRP). He is also a Scientific Vice-President of the NCRP, a member of the NCRP Board of Directors and chairs it's committee on Radiation Protection in Medicine. In addition Dr. Bushberg is a member of NCRP's scientific advisory committee on Non-ionizing Radiation Safety. The NCRP is the nation's preeminent scientific radiation protection organization, chartered by Congress to evaluate and provide expert consultation on a wide variety of radiological health issues. The current FCC RF exposure safety standards are based in large part on the recommendations of the NCRP. Dr. Bushberg was elected to the International Engineering in Medicine and Biology Society Committee on Man and Radiation (COMAR) which has as its primary area of interest the examination and interpreting the biological effects of non-ionizing electromagnetic energy and presenting its findings in an authoritative and professional manner. Dr. Bushberg is also a member of a six person U.S. expert delegation to the international scientific community on Scientific and Technical Issues for Mobile Communication Systems established by the Federal Communications Commission.

Dr. Bushberg received his Masters of Science and Doctorate degrees in Health and Medical Physics from the Department of Bionucleonics at Purdue University. The scientific discipline of Health Physics is devoted to radiation protection, which, among other things, involves providing analysis of radiation exposure conditions, biological effects research, regulations and standards as well as recommendations regarding the use and safety of ionizing and non-ionizing radiation. Dr. Bushberg is certified by several national professional boards with specific sub-specialty certification in radiation protection and medical physics. Prior to coming to the University of California, Davis, Dr. Bushberg was on the faculty of Yale University School of Medicine.